**ROHM**
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ROHM's Compiler Development - Improving Reliability with SuperTest

Japanese semiconductor company ROHM Co., Ltd. was established in 1958 in Kyoto and has since come a long way. The company was named 'ROHM' after the letter 'R' in its original main product, resistors, plus 'ohm', the unit of resistance. In line with the company's mission of 'Quality is First', the R now also stands for 'Reliability'. Today, the company designs and manufactures integrated circuits (ICs), discrete semiconductors, and other electronic components for the ever-growing automotive, industrial equipment and consumer electronics markets. Having expanded its business from resistors and other passive devices to discrete semiconductors and ICs, the company provides a wide range of solutions for each of these markets.
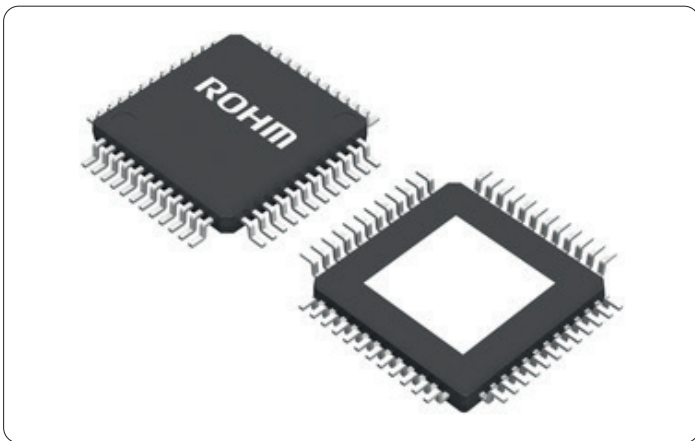
Regarding the ICs that currently form one of its main businesses, in order to be widely adopted in the focused automotive and industrial markets, the development of embedded processors was necessary to provide the required flexibility to the ICs as application-specific standard products (ASSPs). ROHM chose to develop its own embedded processor, which meant it also needed to develop a C compiler for it. The compiler would be based on a Clang front-end and LLVM back-end, and would extensively leverage code optimization to meet the power consumption and footprint requirements of target applications. The development flow would be based around Git for version control, Redmine for project management and issue tracking, Jenkins for automation of routine software development tasks, and finally, Solid Sands' SuperTest for compiler test and validation.

> "There were several good reasons for choosing SuperTest. It covers the C language specification, has a track record of ISO 26262 compliance, performs automatic testing, and it has an automatic verification report output function,"

Compiler bugs registered in Redmine are fixed one by one and the resulting new source code is registered in Git. At the end of each day, a Jenkins process flow automatically extracts the latest source code from Git, builds it, and initiates an overnight SuperTest run at four different optimization levels. The following morning, the SuperTest results are checked and any newly identified defects are registered in Redmine as part of an iterative process. With most of this development environment already in place before ROHM started using SuperTest, integrating SuperTest into the toolchain was accomplished in less than a week.

"There were several good reasons for choosing SuperTest. It covers the C language specification, has a track record of ISO 26262 compliance, performs automatic testing, and it has an automatic verification report output function," said Tetsuya Ooka, Senior Engineer at ROHM. "Another important advantage was that Solid Sands has an agent in Japan."

With compiler development almost complete, ROHM's compiler development team is currently working on the functional safety documentation required for ISO 26262 tool certification, something it knows is very important for its automotive customers.

"During the one and a half years we've been using SuperTest, it has allowed us to continuously improve the quality of our compiler so that the pass rate of SuperTest now exceeds 99.9%," said Tetsuya.

ROHM now plans to continue using SuperTest as part of an ongoing program of tool quality improvement.

SuperTest

Solid Sands

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Founded in 1958, ROHM provides LSI and discrete semiconductors characterized by outstanding quality and reliability for a broad range of markets, including automotive, industrial and consumer market, via its global development and sales network.
In the power field and analog field, ROHM proposes the suitable solution for each application with power devices such as SiC, driver ICs to maximize their performance, and peripheral components such as transistors, diodes, and resistors. For more information on ROHM, visit https://www.rohm.com.

Solid Sands

Solid Sands is based in Amsterdam, the Netherlands. Our mission is to put quality into C.
We do that by improving the quality of C and C++ compilers, libraries and analysis tools, and their safe and secure use, with the best possible test and validation suite. With SuperTest, Solid Sands serves its customers to achieve the software quality level required by the ISO language and functional safety standards. With our history in compiler development, our knowledge of past, current and upcoming versions of the C and C++ standards, new analysis and optimization techniques and new use cases, Solid Sands stays at the fore-front of tools testing and validation.

SOLID SANDS
from Amsterdam is the one-stop shop
for C and C++ compiler and library testing,
validation and safety services.

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